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10/568,350	10/23/2006	Marc Lievin	BDP-0001	2658

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EXAMINER	
BITAR, NANCY	

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
04/29/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@mwzb.com

Office Action Summary	Application No.	Applicant(s)	
	10/568,350	LIEVIN ET AL.	
	Examiner	Art Unit	
	NANCY BITAR	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's response to the last Office Action, filed 11/18/2010, has been entered and made of record.

2. Claims 1-13, 16-18 are currently pending.

3. Applicants arguments filed 2/18/2011 have been fully considered but they are not persuasive.

4. Applicant argues that none of the references teaches projection data that represents a two dimensional projection. Moreover, applicant argues that Mozzo fails to teach or suggest the image-in-image function displayed within a subarea on the monitor. Moreover, applicant argues that no reference teaches a displayed 2D data set is composed of computationally superimposed multiple images and within this corresponding image sub areas are selected for which 3D images are displayed within the context of the overall 2D image.

Examiner disagree with applicant since Delagacz teaches the projection data representing a two dimensional projection of the object (see page 402; last paragraph; "hybrid technique is a shear-warp factorization algorithm is employed in the system") and where the projection is displayed on the screen(see figure 4) wherein a detailed image is produced which has different info content from the projection (paragraph 2:Overview of 3D visualization technique for CT lung images 1st paragraph" slice sequence" of 2D CT images." Examiner refers to Delegacz abstract and section two where hybrid algorithms have been developed that combine the pure image- and object-order approaches to take advantage of their best characteristics and result in improved quality as well as greater rendering speed. An example hybrid technique is a

shear-warp factorization algorithm. Delegacz teaches a segmentation filter to enhance the lung boundaries and filter out small and medium bronchi from of 2D images. The 2D images were further processed with the contour extraction method to segment out only the lung field for further study. In the next step the segmented lung images containing the small bronchi and lung textures were used to generate the volumetric dataset input for the three-dimensional visualization system. Additional processing for the extracted contour was used to smooth the 3-D lung contour in order to eliminate edge discontinuities related to bronchi as well as abnormalities (e.g. nodules) located close to the lung boundaries. The computer program developed allows, among others, viewing of the three-dimensional lung object from various angles, zooming in and out as well as selecting the regions of interest for further viewing. The density and gradient opacity tables are defined and used to manipulate the displayed contents of 3-D rendered images. Thus, an effective "see-through" technique is applied to the 3-D lung object for better visual access to the internal lung structures like bronchi and possible cancer masses. These and other features of the resulting 3-D lung visualization system give the user (physician) a powerful tool to observe and investigate the patient's lungs. Therefore, Delegacz teaching will read on "presenting image data that represents a three dimensional object in a space generating projection data which represents two dimensional projection". Moreover, the argument that 2D subareas are accessed in 3D database is not taught by Delegacz .Examiner refers to Mozzo et al that teaches dento-maxillo facial imaging wherein images are obtained and are reported as various 2D sections of a volume reconstruction. Also, measurements of the geometric accuracy and the radiation dose absorbed by the patient are obtained using specific phantoms. Mozzo et al teaches in figures 2 and 3 the axial or titled images it is possible to achieve by means of reformatting

called secondary reconstructions, 2D images perpendicular to the dental arch,2D panoramic images and 3D views . The 2D images are obtained by reformatting along planes perpendicular to those of the axial slices (see Mozzo et al figures 4-6). Examiner used the Cheng-Sheng reference in an obvious rejection in order to disclose that the detailed image (image-in-image) is within the sub region (see the visual display of Cheng-Sheng page 55 last page, image in the center row, on the left. It would have been obvious to one skilled in the art to achieve the same aim in a medical visual display system in order to arrive to an image-in-image display. In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and KSR International Co. v. Teleflex, Inc., 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, the use of Monzo reference to access 2D subareas in a 3D database in the Delagacz database in order to have a good ratio between performance and low cost, together with low radiation dose, very interesting in view of large-scale use of the CT technique. All remaining arguments are reliant on the aforementioned and addressed arguments and thus are considered to be wholly addressed herein.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-13, 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delegacz et al (Three-dimensional visualization system as an aid for lung cancer detection) in view of Mozzo et al (A new volumetric CT machine for dental imaging based on the cone beam technique: preliminary results) and further in view of Cheng-Sheng et al (Fast volume rendering for medical image Data).

As to claim 1, Delegacz et al teaches a method for presenting image data (1) that represents a three-dimensional object (7) in a space (see abstract) , comprising generating projection data which represents a two-dimensional projection (6) of the object (7)(hybrid technique, paragraph 2, page 402) by computational superimposing multiple image planes (employ the 2-D paradigm, slice sequence of 2D images, page 402, paragraph 2) , and displaying the projection (6) on a monitor for viewing by a user (note that 2D images can significantly enhance the ability to understand the overall 3-D, picture , page 402, paragraph 2, figure 4) , wherein a sub-area (8) is selected from the projection (6) (selecting the regions of interest for further viewing , see abstract), and a detail image (9) having different information content than the projection (6) is generated inside the sub-area (8), and displaying the detail image (9) is displayed within the sub-area (8) on the monitor (paragraph 2, figure 4) . While Delegacz meets a number of the limitations of the claimed invention, as pointed out more fully above, Delegacz fails to specifically teach the 2D projection of a 3D object and wherein the 2D

subareas is accessed to a 3D database "Specifically, Mozzo et al teaches dento-maxillo facial imaging wherein images are obtained and are reported as various 2D sections of a volume reconstruction. Also, measurements of the geometric accuracy and the radiation dose absorbed by the patient are obtained using specific phantoms. Mozzo et al teaches in figures 2 and 3 the axial or titled images it is possible to achieve by means of reformatting called secondary reconstructions, 2D images perpendicular to the dental arch,2D panoramic images and 3D views. The 2D images are obtained by reformatting along planes perpendicular to those of the axial slices (see Mozzo et al figures 4-6). It is obvious to one skilled in the art to use the pictures of the 3D object and the subareas based upon 2D images as taught in Mozzo in the Delagacz database in order to have a good ratio between performance and low cost, together with low radiation dose, very interesting in view of large-scale use of the CT technique in such diagnostic applications. Neither Delagacz nor Mozzo teaches "displaying the detailed image within the sub-area on the monitor". Specifically, Cheng Sheng et al. teach the display of the image (x, y) in the center row (see page 55, section 2.2-2.3, left image). it would have been obvious to one of ordinary skill in the art to locate the image within the sub region in Delegacz display in order to see more clearly the inside structure of the human body, thus achieving the goal of simulated surgery. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 2, Delegacz et al teaches method in accordance with claim 1, wherein the detail image is generated in direct or indirect recourse to the image data (1) from which the projection is generated, and this image data (1) is collected in a first data record (shear-warp

factorization algorithm; saving the single rendered frame to a disk file, section 5.2, page 406; see also Mozzo et al table 1).

As to claim 3, Delegacz et al teaches the method in accordance with claim 1, further comprising the user selecting one of several possible detail images (9), which differ in their information content (the user interface allows, among others, to change the size of displayed slices, fwd or rewind the slices, the user can choose the full set of slices including the intermediate ones or the collection of original slices only, section 5.1, page 405; note that Mozzo teaches different profiles of the teeth (see page 1560).

As to claims 4 and 8, Cheng-Sheng et al teaches method in accordance with claim 1, wherein a detail image (9) is a sub-projection (10) which differs from the projection (6) in that the depth of field is greater and fewer image planes (4) are superimposed when sub-projections (10) with higher depth of field are generated than when projections (6) are generated. (The simulated surgery that produces sub projection with a relatively high clarity of depth since few layers are superimposed; section 2.3).

As to claim 5, Delegacz et al teaches method in accordance with claim 4, wherein the plane (4) of the sub-projections (10) is parallel to the plane of the projection (6) (sequence of consecutive frames in parallel, paragraph 2; see also Cheng-Sheng figures on page 50).

As to claim 6, Delegacz et al teaches the method in accordance with claim 1, wherein a separate window is opened on the monitor, in which various sections are displayed by the object (7) within the frame of the selected sub-area (8) (figure 4).

As to claim 7, Delegacz et al teaches the method in accordance with claim 1, wherein a volume presentation or a surface display takes place in the separate window (paragraph 5.2 and figures 9 and 10).

As to claim 9, Delegacz et al teaches method in accordance with claim 1, wherein exactly one image plane (4) represents a sub-projection (10) (see figure 4).

As to claim 10, Delegacz et al teaches method in accordance with claim 1, wherein the user has interactive access to the image information in the sub-area (8) by moving a pointer instrument to scroll among different layers parallel to the projection planes (interactive software module, section 5.2, page 406, see also abstract).

As to claim 11, Delegacz et al teaches the method in accordance with claim 1, wherein the image data represents a part of a human or animal body and is recorded with a diagnostic system (lung image, section 5, pages 405-406).

As to claim 12, Delegacz et al teaches the method in accordance with claim 11, wherein the image data is recorded with a computer tomography (CT), a magnetic resonance tomography (MR), or by digital volume tomography (DVT) (In the particular area of lung imaging aimed to support screening and diagnosis of lung diseases the radiographic methods like conventional X-ray (XR) and computed tomography (CT) are most commonly used, page 402, Introduction)

As to claim 13, Cheng-Sheng teaches the method in accordance with claim 11, wherein the image data is recorded with a C-arch, which is rotated around the object (see Introduction).

The limitation of claims 16,18 has been addressed above

6. **Claims 14-15,19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delegacz et al (Three-dimensional visualization system as and aid for lung cancer**

detection) in view of Engel et al (Combing local and remote visualization techniques for interactive volume rendering in medical applications).

As to claim 14, Delegacz et al teaches the method in accordance with claim 1, wherein the detail image is generated with direct or indirect recourse to the image data, which is collected in a second data record, wherein this image data originates from another recording of the object (before submission to the 3D system the input data is usually preprocessed with segmentation algorithms to select the object of interest, the final result is either the 3D surface or volumetric representation of the acquired dataset, paragraph 2, page 402, and section 5.2). While Delegacz meets a number of the limitations of the claimed invention, as pointed out more fully above, Delegacz does not explicitly teaches the second data set.

Specifically, Engel et al. teaches the use of different data sets where a 3D representation of high quality the whole volume or a selected sub volume is rendered with 3D texture mapping on the remote graphics hardware (see figure 9). This strategy is also indispensable if the fusion of different data sets is performed to achieve better anatomical understanding (see figure 10). It would have been obvious to one of ordinary skill in the art to record different data sets with different device and in Delegacz in order to achieve better anatomical understanding. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 19, Delegacz teaches the system according to claim 17, wherein the means is a mouse, a trackball or a joystick (page 405, figure 4, it is obvious to use of the following means (trackball, mouse…; to select the slices).

As to claims 20-21, Delegacz teaches the method of claim 3 wherein said information content is the depth, or perspective, or type of display or the depth of information represented by the detail image(section 5.2; note that Delegacz method deals with any clinical display)

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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